CLAIMS

1. A micromachined vibratory gyroscope, comprising: first and second masses mounted in a manner permitting anti-phase dithering motion along a first axis and differential motion along a second axis in response to a Coriolis force produced by rotation about a third axis, and means coupling the masses together through electrostatic forces which are a function of the relative positions of the masses.

2. The micromachined vibratory gyroscope of Claim 1 wherein the electrostatic coupling forces are directed along the first axis so that the masses have different resonant frequencies for anti-phase and in-phase motion along the first axis.

3. The micromachined vibratory gyroscope of Claim 1 wherein the masses are coupled electrostatically along both the first axis and the second axis so that the masses have different resonant frequencies for anti-phase and in-phase motion along each of the first and second axes.

4. The micromachined vibratory gyroscope of Claim 1 wherein the means coupling the masses together includes a plurality of parallel plates connected to the masses for movement in concert with the masses.

5. The micromachined vibratory gyroscope of Claim 4 wherein the plates connected to the first mass are spaced equally between the plates connected the second mass so that motion of the masses toward each other and away from each other results in substantially equal electrostatic forces.

6. The micromachined vibratory gyroscope of Claim 1 wherein the means coupling the masses together includes a third mass which is coupled electrostatically between the first and second masses.

7. The micromachined vibratory gyroscope of Claim 1 further including a plurality of sensors capacitively coupled to the first and second masses for monitoring movement of the masses along the second axis.

8. The micromachined vibratory gyroscope of Claim 1 further including a sensing element coupled to the first and second masses, and a plurality of sensors capacitively coupled to the sensing element for monitoring movement of the masses along the second axis.

9. The micromachined vibratory gyroscope of Claim 8 wherein the sensing element is coupled to the masses electrostatically.

10. The micromachined vibratory gyroscope of Claim 1 wherein the masses are spaced above a planar substrate, the first and second axes lie in a plane parallel to the substrate, and the third axis is perpendicular to the substrate.

11. The micromachined vibratory gyroscope of Claim 1 wherein the masses are spaced above a planar substrate, the first and third axes lie in a plane parallel to the substrate, and the second axis is perpendicular to the substrate.

12. A micromachined rate sensor, comprising first and second masses which are coupled together electrostatically and mounted in a manner permitting anti-phase dithering motion along a first axis and differential motion along a second axis in response to a Coriolis force produced by rotation about a third axis.

13. The micromachined rate sensor of Claim 12 wherein the first and second masses are coupled together through electrostatic forces which are a function of the relative positions of the masses.

14. The micromachined rate sensor of Claim 12 wherein the electrostatic coupling forces are directed along the first axis so that the masses have different resonant frequencies for anti-phase and in-phase motion along the first axis.

15. The micromachined rate sensor of Claim 12 wherein the masses are coupled electrostatically along both the first axis and the second axis so that the masses have different resonant frequencies for anti-phase and in-phase motion along each of the first and second axes.

16. The micromachined rate sensor of Claim 12 further including a plurality of sensors capacitively coupled to the first and second masses for monitoring movement of the masses along the second axis.

17. The micromachined rate sensor of Claim 12 further including a sensing element coupled to the first and second masses, and a plurality of sensors capacitively coupled to the sensing element for monitoring movement of the masses along the second axis.

18. The micromachined rate sensor of Claim 17 wherein the sensing element is electrostatically coupled to the masses.

19. The micromachined rate sensor of Claim 17 wherein the sensing element comprises a rectangular frame which surrounds the first and second masses and is coplanar with them.

20. The micromachined rate sensor of Claim 12 wherein the first and second axes are perpendicular to each other and to the third axis.